Shared Basin Management (Disputes vs. Cooperation): Israel-Palestine, A Case Study

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Water issues in the Middle East are often portrayed as an international problem with opposing states competing for resources that are becoming inexorably scarcer. Such a perception prevents us from understanding the multi-scalar interactions that determine the various forms of water management in the region. In a case such as the Israeli-Palestinian one, it prevents us from understanding how these overlapping modes of management are affecting water quality within shared aquifers, which in turn generates problems concerning water quantity. Indeed, the more degraded the quality of water is, the less uses it can satisfy.

The present water situation is characterised by highly centralised water management in Israel, institutionalised since the 1950s, and highly decentralised water management in the Palestinian territories. Attempts at negotiating agreements over water in the region have been framed since the Johnston Plan, concerned with sharing surface water in the 1950s, in purely quantitative terms, as if water were an immobile resource. Thus, the Interim Agreement, concluded in 1994, attributed set quantities from each of the three West Bank aquifers to Israelis and Palestinians. It treated water as if it was a pie to be divided among two peoples. Yet, water flows. And its quality changes as it flows. When a Palestinian farmer practices flood irrigation within his plot of land, much of this water returns to the aquifer. But it often does so laden with fertilisers or insecticides. This water, and the accompanying chemicals, then reappears later in a well that is used for drinking water by either Palestinians or Israelis. Once consumed, this drinking water reappears as waste water, now laden with bacterial contaminants. Disputes and cooperation concerning water thus target a mobile resource the quality of which keeps changing as it flows. Important efforts were made in 2007 to reformulate the water issue in the Israel-Palestine case, to abandon the myth of water as a gold mine that needed to be shared quantitatively. These efforts occurred while Israel was progressing along its policy to supply an increasing amount of water from desalination to its population and while the World Bank launched a call for a feasibility study of the Red-Dead Canal project. A historical overview of water management in the Israel-Palestine case is necessary in order to understand the present bottlenecks in progressing towards a sustainable management of the water shared by the two entities. Each period in recent history has left a legacy concerning water management. Each has contributed to shaping the manner the water crisis is now defined in the region and the accompanying solutions that seem acceptable or not to either party. Examining the origin and the impact of each of these legacies allows us to understand the stakes involved in each of the three topics that, water-wise, marked 2007 in the region: the elaboration of an agreement concerning joint water management within a final peace treaty, the pursuit of supply management policy in Israel through desalination and the beginning of a feasibility study of a canal linking the Red Sea and the Dead Sea.

A Mandate Legacy of Faith in Technology

The present day Israeli and Palestinian territories lay within the territory of the Ottoman Empire until the end of the First World War. Until the British Mandate was established over Palestine, water had been managed at the local level, with spring or well users themselves determining the rules governing water use, access and allocation. Water was very rarely sold.

Farmers sharing a spring developed rotations of water turns on a time basis whereby they successively directed water to their respective plots via gravity fed irrigation networks. The Mandate authorities, realizing that water law literally varied from one village to another and facing the absence of any real definition of water rights and land tenure deeds, were reluctant to invest in hydraulic infrastructure. They deployed much effort between 1929 and 1937 to formulate a water law that would apply uniformly over the territory of the mandate and would allow for "efficient" use of water in irrigation according to an engineer's understanding of that term. Their efforts failed.

British efforts to develop a water law corresponded to an attempt to depoliticize Jewish immigration to the Mandate of Palestine. Churchill's White Paper of 1922 declared the 'absorptive capacity' of Palestine would determine the number of Jewish immigrants allowed to enter the territory. (El Eini, 1996) The Zionist leadership claimed this absorptive capacity could be limitless if the country was modernised. Its water experts developed a discourse of water abundance in the area according to which technology alone was necessary. Water was available, they claimed, all that was needed was a means to extract and channel it. Mekorot was created in 1937 within this context, for the purposes of planning, executing and running waterworks for irrigation and consumption throughout the mandate of Palestine.

Faith in technology still contributes to shaping the definition of water issues in Israel-Palestine to this day. Facing water scarcity, two solutions can be pursued: demand management, whereby attempts are made to reduce the quantity being consumed, or supply management, whereby attempts are made to increase the supply of water. Since the mandate days, a deep faith in technology systematically privileges supply management. This paved the way to the construction of an extensive water infrastructure in the past and is now promoting the present desalination policy in Israel and the development of the canal linking the Red Sea and the Dead Sea.

The Post-Independence Discourse of Water Scarcity

After the emergence of Israel, the Zionist water experts' discourse changed from one of water abundance to one of scarcity. By 1957, they had progressively reviewed their 1950 estimate of renewable resources, 2800 million cubic meters per year, downward to 1850 million cubic meters per year. (Alatout, 2007) Law 5715-1955 concerning drilling and law 5716-1955 on water metering were proclaimed in 1955. Law 5718-1959 on drainage and flood control was proclaimed in 1957. These three laws were consolidated into the Israeli Water Law in 1959. It withdrew water once and for all from the private and communal spheres, a challenging political decision which was legitimised by the new water scarcity discourse. Within 90 days of the promulgation of the water law in 1959, the control of water switched from a totally fragmented situation where every well and every spring had its own law, to an extremely centralized situation. All water users had to apply for a one year-long production licence from the Water Commissioner, who could stipulate any new condition judged necessary in order to conserve water stocks and to improve the efficiency of water management and use.

This extremely centralised water management in Israel was accompanied by the development of a large infrastructure. The National Water Carrier was completed by 1964 to bring water from Tiberias Lake through the north of Israel to the south of the country as the goal of greening the desert was a fundamental tenet of Zionism. This reduced the flow of the lower Jordan, which runs south, from Tiberias Lake to the Dead Sea. The disappearance of the Dead Sea thus began, and was later accelerated by the construction of the King Abdullah Canal in the 1960s, which fed on water from the Yarmuk, a tributary of the lower Jordan. This canal, initially intended to develop irrigation within the Jordan Basin, was later also used to bring water to Amman. Both uses decreased the amount of water that actually flowed to the lower Jordan to replenish the water the Dead Sea lost every year via evaporation. The disappearance of the Dead Sea was also accelerated by the activities of the Israeli and Jordanian companies that developed evaporation ponds in order to mine the salt and minerals.

Meanwhile, the West Bank became a part of Jordan where the former situation continued regarding water management. Wells are much more easily drilled along the coastal plain than in the rocky soil of the West Bank, and, until 1950, most water use in the West Bank originated from springs and rain collection. Capital and technology became available in the 1950s and 1960s for villagers to drill wells along

the northwestern edge of the West Bank. Farmers pooled their savings and created "well companies" in order to gather the necessary funds. The Jerusalem Water Utility was created in the mid 1960s, with the aim to provide piped domestic water to urban dwellers in Ramallah, Jerusalem and Bethlehem. Its progression was stopped by the 1967 war, when it had only reached the northern part of East Jerusalem.

The post-independence discourse of water scarcity developed in Israel in the 1950s legitimised a highly centralised water management carried out by the state via a large infrastructure. This discourse is still hegemonic today. Although such a centralisation did not occur either in the Gaza Strip or in the West Bank, such a discourse has a deep impact on the Palestinian territories today. The decentralised water management that occurs there is often portrayed as inefficient, as if it was responsible for the scarcity and the water quality problems. Yet, water management can be carried out very efficiently or inefficiently in either a centralised fashion or in a decentralised fashion.

The Legacy of Occupation

On 15th August 1967, only a few weeks after the Six Days War, Military Order No. 92 granted complete authority over all issues concerning water in the Occupied Territories to an Israeli officer named by the Area Commander. This strays from the Israeli Water Law but that difference is coherent with the fact that Israel never annexed the West Bank and the Gaza Strip. It remained militarily occupied territory and Israel never extended its national laws there, as opposed to East Jerusalem and the Golan, which were both annexed. A few months later, Military Order no. 158 of 19th November 1967 submitted the construction of any new water installations to the prior obtainment of a permit and allowed the confiscation of any water resource for which no permit existed. Finally, Military Order No. 291 of 19th December 1968 invalidated all prior and existing arrangements of disputes concerning water.

These military orders granted Israel, in theory, total and complete control of water use and water access in the West Bank. In practice, however, Israel did not extend its power as far as these military orders allowed. It used them to limit severely any new well drilling by the Palestinians and to impose a quota on the existing agricultural wells that generally matched the quantity used within the first year it was metered. However, Israel allowed the persistence of customary institutions in water management. It did not interfere with the manner Palestinians determined how the water that was allocated to them by this Israeli-imposed quota would be used, accessed and allocated.

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The occupation of the West Bank and Gaza Strip allowed Israel to cap overall Palestinian water use to the quantities already used in 1967. In the meantime, Israel increased the quantity of water it used by developing its own infrastructure. By the eve of the Declaration of Principles, in 1993, Israel was thus using about 80% of the renewable resources of the West Bank aquifers. In many cases, Israel had also extended its water network to Palestinian towns and villages, supplying Ramallah with 70% of the domestic water it consumed by the time the Oslo agreements were signed, for example. Thus, while the occupation has led to a quantitative appropriation of water that seriously advantages Israelis overall, it has also seen the Israeli Water Commissioner slash, in drought years, the water allocations to Israeli farmers while it maintained the allocations to Palestinian municipalities. The interdependence of the Israeli and Palestinian water networks that developed during the occupation was made largely invisible by the concomitant development of a nationalist discourse concerning water, focussing only on the overall quantitative allocation to one party and to the other. This discourse also made invisible the persistence of water management carried out, at the local level, by informal Palestinian institutions.

The Legacy of the Oslo Agreements

The Oslo agreements, a series of three agreements signed in 1993, 1994 and 1995, created the Palestinian Authority and the Palestinian Water Authority

as the regulator for water management in the Palestinian territories.

The Cairo Agreement of 4th May 1994 between Israel and the Palestinians declared that water and sewage systems and resources in PA areas "shall be operated, managed and developed (including drilling) by the PA, in a manner that shall prevent any harm to the water resources." This was to the exclusion of all the hydraulic systems of the settlements and the area of military installations. While it does not define the term "harm", this agreement also commits the PA "not to harm the existing water quantities."

The agreement signed in Washington on 28th September 1995 by Israel and the Palestinians proceeded with an allocation of the renewable water resources deemed to exist within each of the three aquifers. It essentially recognised the quantities of water used by each party according to the appropriation that had developed through the years of occupation. Some of the water allocated to the Palestinians was not yet being extracted, however. The figures used now seem to have been optimistic concerning the quantities of water that could still be accessed by the Palestinians via new drilling projects without harming the overall renewable resources. The 20/80 ratio therefore may prove to be yet more unequal in reality.

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The 1995 treaty recognized Palestinian water rights without defining them. It specified these rights would be settled in the permanent status negotiations. The treaty also set up a permanent Joint Water Committee made up of an equal number of Palestinians and Israelis who reach their decisions by consensus. The Joint Water Committee deals with all water and sewage related issues in the West Bank. Its agreement is necessary for any well drilling, well exploitation permit issuance and water development by the Palestinians.

The Oslo agreement thus created a structure, the Palestinian Water Authority, the powers of which were modelled on those of the Israeli Water Commissioner, while it remained dependent on the Joint Water Committee. Created as a regulator, the Palestinian Water Authority initially had nothing to regulate, and could not do so unless it resorted to one of two possible routes. It could try to wrestle water control out of the multitude of mostly informal Palestinian institutions that already exerted it or it could try to acquire control over new resources thanks to the donor funded drilling of wells for domestic water. To this day, the PWA only regulates water for domestic use.

Present Palestinian Water Management

In 2002, the PA promulgated its water law after seven years of preparation. This law declared the PWA was the water regulator. As is often the case around the world, a great disparity persists between the text of the law and the reality of water management institutions. The law was elaborated with the help of international consultants who promoted principles of state water management advocated by international organizations. It was not constructed through a negotiation with the local institutions that actually manage the bulk of the West Bank water. The implementation of this law never materialized. In the meantime, the Ministry of Local Government kept managing many of the drinking water networks via the municipalities and the local communal or private institutions managed 70% of the water used by the Palestinians, i.e. all of the agricultural water and many drinking water networks. The progression of the 'Israeli Separation Fence' to isolate Israel from the Palestinians, starting in 2002, had a major impact on water management for the Palestinians. In the first phase of its construction, it affected negatively a great number of Palestinian wells. Most Palestinian NGOs publishing on this issue focussed on the overall amount of water 'lost' by counting the number of wells that ended up lying on the Western side of the fence and adding their yearly quotas. Yet, the most important impact of the fence, water-wise, was the fact it only affected negatively wells that were managed by local, mostly informal, Palestinian institutions, wells that had completely escaped control by the PWA and were mostly used for irrigation. (Trottier, 2007) Its serpentine path allowed it to leave unaffected the wells operated by the Palestinian Authority either through the Ministry of Local Governments or the Palestinian Water Authority, which are only used for domestic consumption.

In the summer of 2006, Israel disengaged unilaterally from the Gaza Strip. The legislative elections in the Palestinian Authority had designated Hamas as the winner earlier that year, but the party was prevented from governing. It took over in the Gaza Strip in early 2007 while another technocratic government ruled from Ramallah, leading, in effect to the simultaneous presence of two Palestinian governments, one for each of the two territorial entities. The Palestinian Water Authority was never established as a ministry, its head being nominated by the Palestinian President. It has thus kept operating in the Gaza Strip throughout 2007. The Hamas government in the Gaza Strip developed relatively good working relations with the local branch of the Palestinian Water Authority.

Managing Shared Basins: The Present Challenge

Negotiations concerning a final status agreement, i.e. a peace treaty between Israel and Palestine have been plagued by these historical legacies: the faith in technology that originated in the mandate days and still promotes supply management, the discourse promoting centralised water management as the only response to scarcity that originated in Israel shortly after its independence, the unequal overall water allocation between Israelis and Palestinians that resulted from over forty years of occupation, and the creation of a Palestinian Water Authority by the Oslo agreements modelled on the Israeli method of centralised management that never had the institutional capacity to gather in its hands the powers which these agreements theoretically conferred to it. As a result, negotiations concerning water have only been conceived as the determination of a quantity of water that would be allocated to each of Israel and Palestine, once and for all. The year 2007 was marked by the growing realisation that this could never constitute a solution.

Rainfall fluctuates widely from year to year in this area. Climate change is making such fluctuations even less predictable and, probably, less abundant. Treating water as a pie to be divided quantitatively as if it were a gold deposit is made difficult by the fact the size of the pie fluctuates in an unpredictable fashion, but is more likely to shrink than to increase in the future. Moreover, water flows, and its quality changes as it flows. The same water drop is liable to be used seven times between the moment it falls as rain and the moment it reaches the sea. Its bacterial and chemical content will change every time it is released into the environment. Moreover, even if a quantitative division of water appeared equitable in the present context, demographic growth, in each of Palestine and Israel, and economic development would inevitably mean that such a division would appear inequitable after a number of years. Such simple considerations were never integrated in the formulation of the problem and its possible solutions because negotiations were framed since the Johnston Plan in the 1950s in terms of quantities of water allocated to the various parties. The discourse equating efficient water management to centralised planning further buttressed the idea that each government needed a number so that its experts could then proceed with the centralised management of that quantity. No consideration was given to the existing institutional capacity that rested with the present decentralised Palestinian management of water.

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Although the Annapolis meeting in November 2007 did not occasion any negotiation on water, much work occurred that year to reformulate the water negotiation in a more realistic manner. This would entail building on the existing, functioning institutions on both sides. Instead of parachuting institutions on Palestinian society modelled on Israeli state structures, a successful agreement could build on those institutions already exerting social control on the management of water in Palestine. A successful agreement would recognise the centrally managed character of Israeli water and the decentralised character of Palestinian water management and would cater to both realities. A window of opportunity is offered by the fact that the main Israeli concern in 2007 was the quality of the aquifers while the main Palestinian concern was accessing greater quantities of water. This occurred in a context where Israel was pursuing the development of its large-scale desalination policy and while the World Bank called for proposals to carry out

a feasibility study of a canal linking the Red Sea and the Dead Sea. Israel's relying on additional supplies of water that would not fall in the definition of shared water, and would therefore remain its own, allows it to be more mindful of the degradation of the quality of the shared aquifers. An agreement that would allow joint management of the shared water on the basis of continuous monitoring of the aquifers determining the extraction rates, one that would give equal rights to both Israelis and Palestinians and where institutions' requests for water would be judged on a case by case basis, using criteria determining priority of need and impact on the aquifer, is now a realistic possibility. In the short term, this would allow the Palestinians an increase in the quantity of water they use while it would protect the aquifers and serve as an insurance policy for Israel in case it needs to forego its desalination goals. The debate concerning water in Israel/Palestine was elevated to this level for the first time in 2007.

Desalination

The production of water through desalination corresponds to a supply management approach. It is energy intensive, technology-intensive, capital intensive, and centralized. Seawater desalination plants involve, everywhere in the world at present, some form of public-private partnership. The legacies of past periods formulated the water problem in a fashion that portrayed desalination as the solution in Israel/Palestine.

Israel embarked on a path of large-scale desalination when it completed a Desalination Master Plan in 1997 and approved and budgeted large-scale seawater desalination facilities in 1999. It now expects to have coastal plants providing over 500 million cubic meters of water by 2013. The Ashkelon plant, the first of these five plants, is the largest reverse-osmosis plant in the world, producing 100 million cubic meters per year, or 15% of total Israeli domestic demand. It was voted "Desalination Plant of the Year" in the Global Water Awards of 2006 in Dubai, and the Ashdod plant was awarded the title of "Deal of the Year" for 2007 by Project Finance (Garb 2008). In addition, Mekorot also operates 31 small plants in the south of the country.

While desalination eliminates Israel's vulnerability to the vagaries of rainfall and climate change, it is making it dependent on water quality in the Mediterranean and vulnerable to energy price variability. Soaring energy prices throughout 2007 and 2008 are now making desalinated water increasingly expensive. Desalination of brackish water is already occurring in the Gaza Strip while, in 2008, Israel offered to extra-territorialize a piece of land next to Ceasaria in order to allow for the construction of a coastal desalination plant to supply Palestinians with water. Given the state of the Palestinian economy, however, whether the cost of desalination is bearable over the long term for them is highly debatable.

Desalination is allowing a window of opportunity to reformulate the terms of the water negotiation between Israel and the Palestinians. As it increases the overall amount of water available for consumption, it makes it possible to consider joint management within a final agreement concerning shared aquifers. However, like any supply management approach, it will unavoidably stimulate demand for domestic water. Unavoidably, a time will come when water supplied by desalination will be deemed too little either because economic reality will prevent the completion of the present plan or because demand will have outstripped supply.

The Red-Dead Canal

In 2007, the World Bank launched a call for proposals for a feasibility study of a canal linking the Red Sea and the Dead Sea. This project has a long history. The Harza JRV Group carried out a pre-feasibility study on a very similar project between 1995 and 1997. It calculated the costs of three components: the conveyance of sea water from the Red Sea to the Dead Sea, the desalination facility by the side of the Dead Sea and the transmission of desalinated water to Amman and Jerusalem. The calculations were based on a flow varying from 40 to 80 cubic meters per second. The study used the water demand projections provided by the Water Authority of Jordan and by the Water Commission of Israel and concluded that the project would be necessary by the year 2010. It was turned down as too expensive a manner of generating domestic water.

The present project of a 'peace conduit' for which a feasibility study has now been ordered by the World Bank only caters to the first component of the 1995 project, i.e. the canal linking the Red Sea and the Dead Sea. This first component represented more than one third of the overall project's estimated costs. It was isolated from the other two in the hope that an

'environmental' project would be funded by a grant from the international community rather than through a loan, which would reduce the overall costs of the project significantly. The present project is thus promoted to save the Dead Sea from disappearing. It has met opposition from environmentalists, however, who point out that the Dead Sea received a supply of fresh water, not marine water, throughout its history. Filling it with Red Sea water, they argue, could hardly restore it to its earlier condition.

The beneficiaries of the Read-Dead project are the three governments of Israel, the Palestinian Authority and Jordan. They each face different stakes concerning water within their territory and the realisation or not of this infrastructure project will affect them in very different fashions. If realised, this project will completely transform the ecology and the water management situation of the region.

Conclusion

As Israelis and Palestinians, water-wise, were walking a tightrope in 2007, facing the degradation of their overused, shared aquifers in a context of drought that may very well become recurrent because of climate change, propositions finally emerged for a sustainable joint management that would steer them towards demand management and away from the course of supply management bequeathed by past developments. Ironically, large infrastructure projects firmly rooted in a supply management approach, such as desalination and the Red-Dead Canal, allowed this window of opportunity. Indeed, an increase in a water supply it will not share with Palestinians made Israel's concerns concerning the quality of the shared aquifers more audible. Only a sustainable agreement with the Palestinians, one that will capitalise on functioning institutions' capacities while integrating their needs, will allow a management of the shared aquifers that will prevent their continued degradation.

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